
Space Weather Forecast

Issued on Wednesday, 26 April 2023 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: G1/Minor-G2/Moderate Storm risk Days 1-3 (26-28 Apr). Chance of M-class flares (R1-R2 Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with only a small number of minor Common-class flares observed. There are currently seven sunspot regions on the visible disc. The largest region is located in the southeast quadrant, although this region appears generally stable. Another region just to the southeast of the largest group has shown slight development with modest complexity and size. A new region has rotated over the northeast limb. This appears to be relatively large, however, confidence in the assessment of this sunspot group will increase as the viewing angle improves. The remaining sunspot regions are all small and simple at present.

A Coronal Mass Ejection (CME) emanating from a region around 35S 25W beginning around 25/1900 UTC appears to be directed below Earth orbit, although further solar imagery is required to confirm this.

Solar Wind / Geomagnetic Activity: The solar wind was initially at slightly elevated levels around 470km/s, but increased to become elevated from around 25/0030 UTC. Winds peaked at 575km/s at 25/0229 UTC before gradually and somewhat erratically easing through the remainder of the period, with winds more generally between 500-550km/s observed. The Interplanetary Magnetic Field carried by the solar wind was initially moderate, but has been at weak levels since 25/0030 UTC. The important north-south component was initially moderate and northward directed. It is now weak and generally negative. Geomagnetic activity has been largely Quiet (Kp 0-2), but with an Unsettled (Kp3) interval 25/1500-1800 UTC.

Energetic Particles / Solar Radiation: Solar radiation has been at background levels throughout.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is most likely to remain Low, with a chance of reaching Moderate levels.

Solar Wind / Geomagnetic Activity: A CME that left the sun on 24 Apr is forecast to have an Earth directed component, arriving either late on Day 1 (26 Apr) or on Day 2 (27 Apr). Another CME that took place on 26 Apr is awaiting further imagery to determine if it likely to become geo-effective.

Solar winds are currently at elevated levels, but expected to ease on Day 1 to become slightly elevated. The arrival of a fast wind from an equatorial coronal hole is anticipated later on Day 1 or on Day 2 with wind speeds eventually increasing to elevated to strong levels. Solar winds should remain at similar levels into Day 3 and 4 (28 and 29 Apr).

Geomagnetic activity is currently Quiet and expected to be at Quiet to Unsettled levels through much of Day 1, until the anticipated fast wind/CME arrivals either later Day 1 or on Day 2. Activity is then likely to become Active to G1/Minor Storm, with a slight chance of G2/Moderate

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Storm intervals on Day 2. Geomagnetic activity is expected to wane during Day 3 and 4 (28 and 29 Apr), most likely returning to Quiet or Unsettled levels.

Energetic Particles / Solar Radiation: Solar radiation is currently at background levels and expected to remain at such levels during the period.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	20	50	20	5
Strong	G3	No	5	10	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	20	20	20	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	3	3	3	3
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)